NOTES.

THE knighthood just conferred upon Dr. W. H. Perkin, F.R.S., has given much satisfaction in scientific circles. The great interest being shown in his services to science and industry, on account of the celebration of the coal-tar colour jubilee to-day and to-morrow, makes this official mark of recognition of his work particularly welcome. It was fifty years ago when Sir William Perkin discovered the first anilin dye—mauve—and so founded the coal-tar colour industry, which has been so profitably developed in Germany. His knighthood, with the other honours and addresses which will be presented to him at the Royal Institution to-day, thus form an appropriate crown to his successful career.

THE University of Oxford has recently taken a new departure in scientific teaching. Under the energetic conduct of Prof. Sollas, a contingent from the geological class started to spend a week among the Alps for the purpose of studying on the ground the structures which have in recent years been so keenly studied and discussed, especially the recumbent folds that are claimed to play a large part in the architecture of the mountains. At Lausanne on June 30 they were met by the enthusiastic explorer of Alpine geology Prof. Lugeon, who took charge of the excursion, and enabled the members of the party to see with their own eyes some of the gigantic disturbances to which the region has been subjected. They followed one after the other the folds and internal structure of the Préalpes médianes, and finished up with a glimpse of the successive vast folds of the central crystalline region. Starting sometimes as early as 5 a.m., they spent long days in climbing and viewing the disposition of the rocks from favourable points of view, and, thanks to the clear expositions of the eminent Swiss professor, learnt more in a few days on the ground than they could have acquired by months of sedulous reading.

THE Matteucci medal for 1906 of the Società Italiana della Scienze, the president of which is Prof. Cannizzaro, has been conferred upon Sir James Dewar.

THE Paris correspondent of the *Times* announces the death, at the age of sixty-nine, of Dr. Brouardel, for many years professor of legal medicine at the University of Paris and president of the consultative committee of hygiene.

WE regret to announce that Sir Walter L. Buller, K.C.M.G., F.R.S., distinguished by his work on "The Birds of New Zealand" and other contributions to science, died on July 19 at sixty-eight years of age.

THE death is announced of Mr. J. A. Wanklyn, at the laboratory, New Malden, Surrey, in his seventy-third year. Mr. Wanklyn was a member of the Bavarian Academy, and was well known as an analytical chemist.

A MESSAGE from Danes Island reports that Mr. Wellman has now established wireless communication from within 600 miles of the Pole *viâ* Hammerfest. Everything is progressing favourably at the camp. The construction of the balloon-house is being continued. It is hoped that the expedition will start on its aërial voyage toward the Pole in the middle of August.

ON the east coast patches of burnt earth occur scattered along the margin of many creeks and saltmarshes, especially in Essex. A committee has been formed under the auspices of the Essex Archæological Society and the Essex Field Club for the systematic study of these interesting relics of antiquity, generally known as "red hills," and the settlement, if possible, of the many questions relating to them. Among the members of the committee are Mr. Miller Christy, Mr. William Cole, Mr. T. V. Holmes, Prof. R. Meldola, F.R.S., Mr. F. W. Rudler, and Mr. H. Wilmer, hon. sec. and treasurer. The chairman of the committee is Mr. I. Chalkley Gould.

THE well-known balloon journey made by Comte de Lavaux, the French aëronaut, at the time of the Paris Exhibition in 1900, when the distance from Paris to Moscow was traversed in forty-one hours, was recently surpassed by the brothers Wegener, of the German aëronautical observatory at Lindenberg. The details of their ascent have now been published in the Strassburg *Aeronautische Mittheilungen*. The balloon, of 36,000 cubic feet capacity, and inflated with hydrogen, started from Berlin at 9 a.m. on April 5 last, and descended at 9 p.m. on April 7 six and a half miles east of Aschaffenburg. During their journey of at least 900 miles, the Wegeners crossed the Baltic Sea and Jutland twice, once travelling north and again on the return journey. The route was determined by astronomical observations at night and by visual and photographic observations during the day. The altitudes at which the journey was performed were as follows:—during the day of April 5, 1200 metres; on the night of April 5–6, from 200 metres to 800 metres; from sunrise to midday on April 6, up to 2900 metres; from midday to sunset of the same day, 300 metres to 1000 metres; during the next night, from 100 metres to 800 metres, except when in the vicinity of Hamburg, where the balloon was taken to a height of 2900 metres. The greatest altitude, of 3700 metres, was reached on April 7. The lowest temperature recorded was $-16°$ C.

THE seventh International Zoological Congress will be held in America in August or September, 1907, under the presidency of Mr. Alexander Agassiz. The arrangements for the congress are in charge of a committee of the American Society of Zoologists. The meetings will open in Boston, where the scientific sessions will be held, and from which excursions will be made to Harvard University and to other points of interest. At the close of the Boston meeting the members will proceed to Woods Hole, Massachusetts, visiting the station of the United States Bureau of Fisheries, the Marine Biological Laboratory, and the collecting grounds of the adjacent seacoast. The journey to New York will be by sea through Long Island Sound. In New York the congress will be entertained by Columbia University, the American Museum of Natural History, and the New York Zoological Society, and excursions will be made to Yale University, to Princeton University, and to the Carnegie Station for Experimental Evolution. From New York the members will proceed to Philadelphia and Washington. The first formal circular announcing the preliminary programme of the congress will be issued in October next. All inquiries should be addressed to Mr. G. H. Parker, Seventh International Zoological Congress, Cambridge, Massachusetts, U.S.A.

WITH the recent motor-bus accident on Handcross Hill fresh in our memories, and the discussion that has arisen in the Press in consequence, it is satisfactory to find that at least one note of improvement has been struck, according to the description of an electrically controlled petrol motor-bus given in the *Standard* of July 21. The demonstration referred to was given on the scene of the recent disaster, and the descent was made in perfect safety with-

out the use of any brakes whatever, the driver keeping his feet above the splash board to prove that no pedal brake was in use, and the side hand-brake was tied and sealed before starting the descent. The omnibus in question was driven by an ordinary four-cylinder petrol engine, but was practically under electrical control. The engine is started by an electrical device, and the variations of speed are under electrical control, the clutch and foot-brake being electromagnetic and controlled by one pedal. The speed control is obtained by shunt regulation of the dynamo in combination with the ignition and carburation, and gives the driver—it is claimed—perfect control without the use of brakes. Various tests for pulling up and starting were made and proved satisfactory, and the steepest portion of the hill was taken at a snail's pace without the use of brakes. We can only hope that, should this new method of control continue to prove so satisfactory, it will be adopted by the motor omnibus companies, and thus help to re-establish public confidence in one of the most useful innovations of recent years.

THE provisional programme of Section B (Chemistry) of the British Association meeting at York has just reached us; it is as follows:—*August* 2.—Presidential address, Prof. W. R. Dunstan; chemical research in the Dutch East Indies, Dr. Greshoff; utilisation of nitrogen in air by plants, T. Jamieson; the electrical discharge in air and its commercial application, Sidney Leetham and William Cramp; the action of ammonium salts upon clay and kindred substances, A. D. Hall; oxidation in soils and its relation to productiveness, Dr. F. V. Darbishire and Dr. E. J. Russel. *August* 3.—Report, present position of the chemistry of gum, H. H. Robinson; on a gum (*Cochlospernum gosipium*) which produces acetic acid on exposure to air, H. H. Robinson; report, hydrolysis of sugars, R. J. Caldwell; papers by the president and Dr. T. A. Henry and by Dr. Greshoff. Joint discussion with Section K, the production of hydrocyanic acid by plants. *August* 6.—Report, present position of the chemistry of rubber, S. S. Pickles; the constitution of caoutchouc, Prof. Carl Harries (Kiel); paper by Prof. W. A. Tilden; report, the study of hydroaromatic compounds, Prof. A. W. Crossley. *August* 7.—Joint discussion with Section I, the factors which determine minimal diet values, opened by Dr. F. Gowland Hopkins.

A SPELL of the hottest weather this summer has been experienced since the middle of the month over the Midland and south-eastern districts of England. At Greenwich the thermometer in the shade has exceeded 80° on four days since July 17, while there was only one day previously this summer, June 20, with a temperature above 80°. On July 18 the thermometer in the screen registered 86°·2, and on July 23 it registered 84°·7. On three days this month the thermometer in the sun's rays at Greenwich has exceeded 145°. In the northern and western portions of the kingdom the temperature has been generally below the average. At Greenwich the total rainfall this month, to July 24, only measured 0·22 inch, which is about one-tenth of the average. The weekly weather report issued by the Meteorological Office shows that on July 17 and 18 an exceedingly heavy fall of rain occurred in the north-west of Scotland, the aggregate amount for the two days measuring 4·9 inches at Fort William and 4·4 inches at Glencarron. An exceptionally important storm area for the time of year had its centre near the Shetlands on July 19, and strong westerly gales were experienced on the northern coasts of Ireland and Scotland and in the North Sea.

MR. G. A. HIGHT, writing from Audisques, Pas de Calais, states that among the peasantry of that district there is a universal belief that the magpie is a dangerous enemy to poultry, and it is shot by the farmers as vermin. His own observation seems to show that the stories of the magpie's depredations are unfounded, or at least greatly exaggerated, and he would be glad to know whether there is any authority for the belief.

IN the Proceedings of the United States National Museum, vol. xxx., Mr. T. W. Vaughan describes three new species of corals belonging to the genus Fungia, the one a fossil species from Japan, the others being recent forms.

NEW or rare scombriform fishes form the subject of a paper by Mr. H. W. Fowler in the March issue of the Proceedings of the Philadelphia Academy, in the course of which several forms are described as new, while the genus Lepodus of Rafinesque is made the type of a new family. The same issue contains the second portion of a paper by Messrs. Pilsbry and Ferriss on the land-molluscs of the south-western United States.

THE Natural History Museum has just received an important collection of bird and mammal skins from Mount Ruwenzori, East Central Africa, obtained with the aid of subscriptions from a number of persons interested in natural history. The collection, we believe, includes a number of new forms, or of forms previously known only by a single specimen or so of each.

WE are indebted to Prof. K. Heider for a copy of an obituary notice of the late Dr. Fritz Schaudinn, published at Innsbruck, and reprinted from the *Innsbrucker Nachrichten* for June 26. Dr. Schaudinn's career, although brief (1871–1906), was a memorable and active one. Among the subjects to which Schaudinn specially devoted his attention was the study of blood-parasites, his last achievement in this line being the discovery of *Spirochaeta pallida*, which he believed to be the bacterium of syphilis.

A COPY of an illustrated guide to the German section of the International Exhibition at Marseilles devoted to the illustration of subjects connected with the study of the ocean and sea-fisheries has reached us. In the German section, a prominent place is occupied by exhibits connected with the recent deep-sea and South Polar expeditions, and also by others displayed by the German Sea-fisheries Union of Hanover. The frontispiece to the guide represents a reproduction of an Antarctic scene, with seals and penguins on the ice.

IN the summer number (vol. ii., No. 2) of *Bird Notes and News* attention is directed to the wholesale collecting of eggs of the great skua in Iceland, as demonstrated by a photograph in a German ornithological serial, in which a collector is represented with no less than 240 eggs of that species. If egg-hunting is permitted on such a scale, it seems scarcely probable that the skua will long survive in the island. In another article gratification is expressed at the support accorded by Her Majesty the Queen to the crusade against the wearing of "osprey" plumes.

AT the date of publication (1880) of Dr. Günther's "Study of Fishes," but three representatives of the genus Chimæra were known to science. By the description in the Journal of the College of Science of Tokyo University (vol. xx., art. 2) of two new Japanese forms, Mr. S. Tanaka has brought up the number to no less than ten. The author seems to have had abundant material—no less

than twenty-one specimens—for the description of his first species, although in the case of the second he had to be content with a couple of examples. Mr. Tanaka has found that the form and direction of the lateral line afford excellent characters for the discrimination of species.

ACCORDING to the June number of the *Museums Journal*, Salford has acquired a new natural history museum. Photography enters largely into the scheme of arrangement of the galleries, this being employed to illustrate the nesting of birds, and likewise to display the contrast presented by deciduous trees in summer and in winter. Attention is directed in another paragraph to the charge made by the trustees of the British Museum for permission to photograph plates and books in the print-room. It is urged that since publishers—who are compelled to supply the museum with a copy of the most expensive edition of each of their books—are the chief applicants for such permission, the new charge is inadvisable.

THE rose-breasted grosbeak, of which a coloured plate is given, forms the subject of the latest educational leaflet (No. 2) issued by the U.S. National Association of Audubon Societies. The following statement in favour of this bird is given :—"The spread of the potato-beetle pest caused an enormous loss to the farmers of the country, not only by the failure of the potato crops, but also by the cost of insecticides, principally Paris green, used to destroy this voracious beetle. It is doubtful whether the farmers of the country would have been able successfully to contend with the potato-beetle had not Nature interposed one of her powerful checks. As the beetle extended its range and became more numerous, the Rose-breasted Grosbeak developed a newly acquired taste for this pest."

A BEAUTIFUL coloured plate (by Mr. H. Grönvold) of hitherto undescribed or unfigured eggs of South African perching-birds forms an attractive feature in the first number of vol. ii. of the Journal of the South African Ornithologists' Union. The accompanying notes are by Messrs. J. A. Bucknill and G. H. Grönvold. In a paper on bird-migration in South Africa (originally read at last year's British Association meeting), Mr. W. L. Sclater directs attention to the occasional breeding of the bee-eater during its (northern) winter sojourn at the Cape. The evidence is indisputable, but the question as to whether the same individual birds breed in May in the northern, and again in October in the southern, hemisphere has yet to be definitely answered. Possibly there are two phases of the bird—the one a northern and the other a southern breeder. Those interested in parasitism among birds should read an article by Messrs. Haagner and Ivy on the breeding-habits of certain South African cuckoos of the genus Chrysococcyx.

THERE is an interesting note by Dr. Raymond Pearl in No. 3 (1906) of the *Journal of Comparative Neurology and Psychology* on the correlation between intelligence and the size of the head. The note is based on the measurements, published last year by Drs. Eyerich and Loewenfeld, of the head-circumferences of 935 Bavarian soldiers, who were also classified according to intelligence. These observers came to the conclusion that there was no relation between the head-circumference and the grade of intelligence, but Dr. Pearl, using more efficient statistical methods, finds a correlation which, though small, is quite sensible. It is pointed out that the result is in accordance with those obtained by Prof. Pearson (Proc. Roy. Soc., vol. lxix.), and it is suggested that the interpretation is probably "physiologic rather than psychologic," the larger size of head and the greater vigour in mental operations being both the consequences of good conditions of nurture.

A REVISED list of the group of red algæ known as Corallinæ is contributed by Mr. K. Yendo to the Journal of the College of Science, Tokio (vol. xx., article 12). The writer, after making a careful study of the generic distinctions laid down by previous authorities, enumerates seven genera, of which Cheilosporum is divided into three, and Amphiroa into four sections.

WRITING in the *Monthly Review* (July) upon the subject of instinct in the lower animals, Mr. C. B. Newland mentions a number of cases illustrating the actions and ways of instinct as manifested in animals, birds, and insects. When the faculty of intelligence is developed the instinctive faculty is diminished. Instinct is perhaps most pronounced in insects, and as an instance of remarkable development Mr. Newland describes the systematic method in which a small ichneumon fly bores into oak-apples with the purpose of depositing its eggs in the grubs of the gall-fly that lie concealed within.

THE second edition of the volume on north Yorkshire, by Mr. J. G. Baker, dealing with the botany, geology, climate, and physical geography, that has been appearing in instalments in the Transactions of the Yorkshire Naturalists' Union since November, 1888, is completed with the part published last April. This part is chiefly devoted to the mosses and hepatics, that have been revised and brought up to date by Mr. M. B. Slater. The name of Dr. Spence is closely associated with the early investigations of these plants, and in Yorkshire he laid the foundations of that knowledge that was put to advantage during his explorations in tropical America. The nomenclature and arrangement of the mosses are based on Braithwaite's "British Moss Flora," and for the hepatics Mr. Slater adopts the arrangement given in Pearson's "Hepaticæ of the British Isles."

THE scientific aspect of what has been designated in the United States as "dry-farming" consists in utilising to the best advantage all the water that falls in semi-arid regions. An article by Mr. J. L. Cowan in the July number of the *Century Magazine* presents the main features of the system, and explains how it is possible to produce fine crops in regions where the rainfall averages only about 12 inches in the year. The first essential is thoroughly to break up the subsoil and collect in it all the rain-water; then, in order to prevent evaporation, the upper layers of the soil are kept in a finely pulverised condition, so that the water cannot rise to the surface by capillary action. Apart from these physical considerations, dry-farming requires continuous and intelligent husbandry. Another hope of the farmer in dry regions lies in finding or producing drought-resistant varieties, and this field of inquiry is yielding a bountiful harvest. In the case of wheat, a hard wheat, recognised in America as a distinct species, *Iviticum durum*, has been introduced from Russia; this gives a better yield in a dry than in a humid climate. Among other suitable "dry-farming" crops are Kafir corn, emmer (a variety of wheat), dwarf milo maize, and varieties of oats and barley.

THE valedictory address delivered by Prof. J. G. M'Kendrick, at the close of the summer session of the University of Glasgow, on the occasion of his resignation of the professorship of physiology, provides a striking

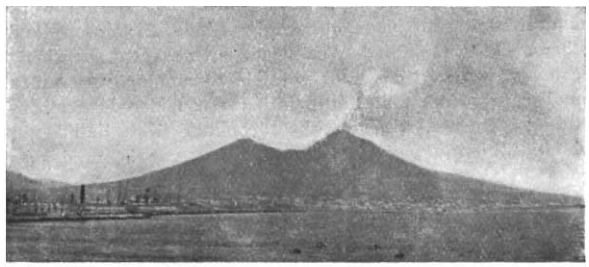
account of the progress of physiological science during the past thirty years. In 1861, when Prof. M'Kendrick attended a course of lectures at Aberdeen, there was no attempt at demonstration except by diagrams and a few microscopes on a side-table. There were no experiments, and the only instrument displayed was a sphygmograph. But a little later Goodsir, of Edinburgh, brought from Continental schools of physiology to the University of Edinburgh such instruments as myographs, kymographs, electrical appliances and other apparatus, and the teaching of practical physiology was soon firmly established under Argyll Robertson. Prof. M'Kendrick himself installed similar teaching in the University of Glasgow in 1876, the date of his appointment to the chair of physiology. The requirements of modern physiological teaching are shown by a statement in the address that while Prof. M'Kendrick has worked and taught for thirty years in five roo twenty-five are apportioned to physiological work in the new buildings. Reviewing the progress of physiology, Prof. M'Kendrick detailed the advances made in histol and expressed the doubt whether much more progress can be expected. Graphic methods have been elaborated during the same period, and the action of electrical stimuli on muscle and nerve elaborately worked out. The study of the functions of living isolated organs, modern vivisectional methods, our knowledge of the nerve paths in the central nervous system, and the subject of internal secretions, are all among the triumphs of physiological science during the past thirty years, and were each passed in review. In conclusion, Prof. M'Kendrick indicated physiological chemistry as the direction in which progress will be made during the next few decades.

THE Engineering Standards Committee has issued a specification for structural steel for bridges and general building construction (report No. 15). The draft of the specification, drawn up by a sectional committee of which Sir Benjamin Baker is president, was submitted to the science standing committee of the Royal Institute of British Architects, and certain modifications have been introduced into the specification as a result of the cooperation of that committee. In view of the authoritative positions held by members of the committee, the specification cannot fail to meet with general adoption.

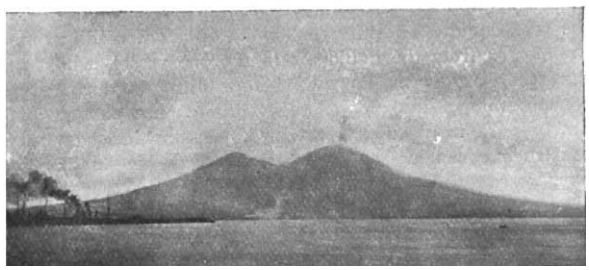
THE *Engineering Review* (July) contains a series of special original articles dealing with the engineering development of several British colonies. The contributions have been limited to Canada, Western Australia, Queensland, New Zealand, New South Wales, and Natal. Farming and mining no longer constitute the only pursuits worthy of notice in these colonies. Railways, roads, and bridges are being constructed, harbour, river, canal, and irrigation schemes are being undertaken, and municipal and sanitary engineering projects are everywhere in evidence. All these developments furnish occupation for professional men and skilled labour.

WE have received from the publishers, MM. Gauthier-Villars, Paris, a set of tables and formulæ compiled by M. J. de Rey-Pailhade for the practical use of instruments graduated in *grades* instead of degrees. The compiler urges the employment of the decimal system in astronomical and navigation tables, and points out that errors constantly occurring in ephemerides, &c., would probably be eliminated if the simpler method were employed. Formulæ for obtaining interpolated values and for calculating star positions, tables for the conversion of sexagesimal into decimal values, and the decimal values of numerous astronomical constants are included in the brochure.

Deutsche Arbeit (vol. v., p. 352) contains an account of a visit to Vesuvius after the late eruption, by Dr. E. Trojan, illustrated by reproductions of photographs, two of which are of some interest as representing the mountain from about the same point of view before and after the eruption. By the courtesy of Prof. R. von Lendenfeld and the editor of *Deutsche Arbeit* these illustrations are given here; they show the changes by which the graceful



(1) Photograph taken on April 4.



(2) Photograph taken on April 18.

Vesuvius before and after the recent eruption. From photographs taken by Dr. E. Trojan from Santa Lucia.

outline of the cone has been destroyed and the mountain converted into a hump-backed mound of distinctly lower elevation.

THE volumes which have now appeared of the Proceedings of the Royal Society of London, as divided about a year ago into two series, are vols. lxxvi.–lxxvii. of series "A," containing papers of a mathematical and physical character, and vols. lxxvi.–lxxvii. of series "B," containing papers of a biological character; each volume runs into about 600 pages royal octavo, with illustrations. A main object of this new arrangement was to render the Proceedings more accessible to workers by placing the two groups of subjects on sale separately, at a stated price attached to each separate part of a volume when it first appears. Moreover, with the view of promoting the circulation of the complete series, it has been directed that a subscription paid in advance to the publishers at the reduced price of 15*s.* per volume, for either series, shall entitle subscribers to receive the parts as soon as published, or else the volumes when completed, in boards or in paper covers, as they may prefer. With a view to increase further the accessibility of the various publications of the Royal Society, each number of Proceedings now contains an announcement on the cover of the more recent memoirs of the Philosophical Transactions as published separately in wrappers, and the prices at which they can

be obtained. It is hoped that by this arrangement the difficulties which have been found to impede the prompt circulation of the journals of the society, which are of necessity published in a somewhat different manner from a regular periodical, may be finally removed.

AN important contribution to our knowledge of the liquefaction of gases is contained in a paper on the liquefaction of air and its application to the manufacture of oxygen and nitrogen, by M. Georges Claude in part i. of the Bulletin of the French Physical Society for session 1906. M. Claude adopts the principle of expansion *with* external work instead of expansion *without* external work as utilised in the plant devised by Linde, Hampson, and others. The result, it is contended, is to effect a surprising economy, while it becomes possible to employ very much smaller pressures than those hitherto considered necessary and to dispense with auxiliary cooling. The liquid air, obtained in this way at very small cost, can be used as a commercial source of oxygen and nitrogen. The two elements are separated by a process of fractional distillation; in the apparatus devised for this object, M. Claude displays remarkable ingenuity. The principle of "recuperative cooling" is adopted, liquid air in one vessel being caused to evaporate by means of gaseous air compressed at 2 to 3 atmospheres circulating in pipes surrounded by the cold liquid. The nitrogen distils off more readily than the oxygen from the liquid air in the one vessel, whilst in the other oxygen is liquefied before nitrogen during the condensation of the air. Finally, nearly pure oxygen and nearly pure nitrogen are obtained. A machine has been constructed capable of supplying 1000 cubic metres of oxygen, containing 96 per cent. to 98 per cent. of the pure element, per day, with the expenditure of an amount of energy equal to only 1/20th or 1/30th that required in the processes based on the electrolysis of water. It is contended that the results obtained invalidate the assumption made by Dewar and confirmed by Linde that in the liquefaction of air the two component gases condense simultaneously; in reality, the more volatile nitrogen is condensed after the oxygen, and the process of liquefaction is strictly the inverse of vaporisation.

THE fourteenth volume of the Bulletin of the Philosophical Society of Washington has now been completed by the publication of the brochure entitled "Organisation and Proceedings." This volume contains abstracts of papers and other communications brought before the society during the sessions 1900–1904.

A SECOND edition of the Class List and Index of the periodical publications in the Patent Office library has been published, price 6*d*., at the Patent Office, 25 Southampton Buildings, Chancery Lane.

MR. EDWIN ANTHONY has issued through Messrs. George Routledge and Sons, Ltd., a pamphlet, price sixpence, on decimal coinage, weights, and measures, in which he discusses the question as to whether this country should adopt them, and passes in review the various arguments for and against the use of decimal coinage and weights and measures.

MESSRS. CHARLES GRIFFIN AND CO., LTD., have published a fifth, revised edition of Prof. G. A. J. Cole's "Aids to Practical Geology." The work has been brought up to date without increasing its size, so that it will maintain the leading position it has gained among manuals of determinative geology.

OUR ASTRONOMICAL COLUMN.

REFLECTING TELESCOPES OF SHORT FOCUS.—In No. 5, vol. xxiii., of the *Astrophysical Journal*, Prof. Vogel discusses the relative efficiency of short-focus reflectors for astrographic work.

Prompted by the discovery of the Nova Persei nebula, Prof. Vogel turned his attention to the subject of reflectors, and finally obtained an excellent parabolic mirror, of 40 cm. effective aperture and 93 cm. focal length, from Mr. B. Schmidt, of Mittweida, Saxony.

With this instrument numerous problems of practical interest in reflector work have been investigated, and the results are tabulated in the present paper. Prof. Vogel also compares the efficiency of an instrument of this type with that obtained from other types of photographic telescope. For instance, he found that with an exposure of thirty minutes on the Pleiades nebula he obtained a photograph showing all the detail seen on Keeler's plates with four hours' exposure using the Crossley reflector. The nebulæ around γ Cassiopeiæ appear quite as distinctly in forty minutes as on the plates taken by Dr. Roberts with ninety minutes' exposure on October 25, 1895.

THE ASTRONOMICAL SOCIETY OF CANADA.—The Transactions, for 1905, of the Royal Astronomical Society of Canada contain a number of papers of astronomical interest, a few of which are mentioned below. In the presidential address Mr. C. A. Chant made a summary review of the progress of astronomy during 1905, referring, among other things, to the spectroheliograph work which is being systematically prosecuted at the Yerkes, Meudon, South Kensington, and Potsdam observatories, and to the important results which these researches in solar physics may lead us in the study of terrestrial meteorology. Other papers selected for publication deal with sun-spots and magnetic storms, colour photography of the corona, stellar classification, and the new problem in solar physics recently enunciated by Dr. C. L. Poor.

MAGNITUDES AND PLACES OF 251 PLEIADES STARS.—At the desire of Prof. Wolf, Herr K. Schiller has continued the researches of Dr. Dugan on the photographic magnitudes and mean places of the fainter stars of the Pleiades group, and now publishes his results for 251 stars in No. 4102 of the *Astronomische Nachrichten*. The places for 1900, and a formula connecting the magnitude scale of the present series with that employed by Dr. Dugan, are given in the paper.

ELEMENTS AND EPHEMERIS OF JUPITER'S SEVENTH SATELLITE.—In No. 4101 of the *Astronomische Nachrichten*, Dr. F. E. Ross publishes the following elements of the orbit of Jupiter's seventh satellite, derived from observations made during the two most recent oppositions, and corrected for the principal perturbations:—

1906 January 0·0 G.M.T. Elements referred to Earth's Equator.

$g = 18°\cdot9$	$e = 0\cdot208$
$\pi = 118°$	$n = 1°\ 386$
$\Omega = 291°$	$\log a = 8\cdot8946$
$i = 25°\ 28'$	Period = 259·7 days

This satellite is only about 2 per cent., or 170,000 miles, more distant from Jupiter than the sixth, but, on account of their large eccentricities, they do not approach within two million miles of each other. The inclination of their orbits to each other is 28° 1′.

In addition to the foregoing elements, Dr. Ross also publishes an ephemeris, corrected for perturbations and giving the position angle and distance of the seventh satellite, for every fifth day between August 15, 1906, and April 27, 1907.

OBSERVATIONS OF MINOR PLANETS AND COMETS.—The results of a large number of observations of minor planets, comets, and comparison stars, made by Dr. J. Palisa with a wire micrometer attached to the 27-inch refractor of the Vienna Observatory, are given in Nos. 4099 and 4100 of the *Astronomische Nachrichten*, by Prof. E. Weiss. The list of objects includes comets 1904 i and ii, and 1905 ii, iii, v and *c*, and 296 comparison stars.